General

Guideline Title

Screening for iron deficiency anemia in young children: USPSTF recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for iron deficiency anemia in young children: USPSTF recommendation statement. Pediatrics. 2015 Oct;136(4):746-52. [18 references] PubMed

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force (USPSTF). Screening for iron deficiency anemia - including iron supplementation for children and pregnant women. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006. 12 p. [12 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the levels of certainty regarding net benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Note: Although the 2006 recommendation included a statement on supplementation in young children, the USPSTF has now determined that given the current widespread use of iron-fortified foods in the United States, including infant formulas and cereals, the impact of making a recommendation on physician-prescribed supplementation is likely limited. For this reason, the USPSTF decided to focus the current recommendation on screening only.

Summary of Recommendation and Evidence

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for iron deficiency anemia in children ages 6 to 24 months. (I statement)

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to children ages 6 to 24 months living in the United States who are asymptomatic for iron deficiency anemia (see Figure 1 in the original guideline document). It does not apply to children younger than age 6 months or older than 24 months, children who are severely malnourished, children who were born prematurely or with low birth weight, or children who have symptoms of iron deficiency anemia. Recommendations regarding screening for iron deficiency anemia in pregnant women and iron supplementation during pregnancy are addressed in a separate recommendation statement (see the National Guideline Clearinghouse [NGC] summary of the USPSTF guideline Screening for iron deficiency anemia and iron supplementation in pregnant women to improve maternal health and birth outcomes: U.S. Preventive Services Task Force recommendation statement).

Suggestions for Practice Regarding the I Statement

Potential Preventable Burden

Estimates of the prevalence of iron deficiency in children ages 1 to 3 years in the United States range from 8% to 14%, and approximately one-third of these children also have anemia. Based on 1999 to 2002 National Health and Nutrition Examination Survey (NHANES) data, the estimated prevalence of iron deficiency anemia in children ages 12 to 35 months is 2.1%. Several factors have been identified that may increase a child's risk for iron deficiency anemia, including prematurity or low birth weight, use of non–iron-fortified formula or introduction to cow's milk in the first year of life, and exclusive breastfeeding without regular intake of iron-fortified food after age 6 months. Demographic factors associated with increased risk for iron deficiency anemia include low socioeconomic status and having parents who are migrant workers or recent immigrants. Additional factors that may be associated with increased risk for iron deficiency in children include weight and height in the 95th percentile or greater, bottle feeding beyond the first year of life, having a mother who is currently pregnant, or living in an urban area. Evidence on whether Hispanic ethnicity increases children's risk for iron deficiency has been mixed, with some studies showing an increased risk and others showing no increased risk. Older data from NHANES (1988–1994) showed that Mexican American children were nearly 3 times more likely than white children to have iron deficiency, whereas more recent NHANES data from 1999 to 2002 found no increased risk in Hispanic children. The USPSTF found no studies that assessed the performance of risk assessment tools to identify children who are at increased risk for iron deficiency anemia.

Some observational studies suggest that iron deficiency anemia in early childhood may be associated with neurodevelopmental and behavioral delays and poorer performance on cognitive tests. However, concluding that there is a direct causal link between iron deficiency anemia and these outcomes is difficult because of the methodological flaws in these studies and potential confounding due to underlying nutritional and socioeconomic differences between groups. The aim of screening for iron deficiency anemia in young children is to identify and treat anemia before it leads to poor child health outcomes.

Potential Harms

The harms of screening for iron deficiency anemia have not been well studied. Potential harms of screening include false-positive results, anxiety, and cost. Reported adverse events of treatment with iron include limited gastrointestinal symptoms, darkening color of stool, staining of teeth and gums, and drug interactions with other medications. The previous USPSTF recommendation also noted that accidental iron overdose can occur in children receiving treatment or supplementation with iron.

Current Practice

No recent nationally representative data on the current rate of screening are available.

Screening Tests

Although the evidence is insufficient to recommend specific tests for screening, measurement of serum hemoglobin or hematocrit is often the first step.

Treatment and Interventions

In the United States, iron deficiency anemia in children is usually treated with oral iron. The usual dose in infants and young children is 3 mg/kg to 6 mg/kg of elemental iron per day in 2 to 3 divided doses.

Other Approaches to Prevention

According to the Institute of Medicine, the Recommended Dietary Allowance for iron in infants ages 7 to 12 months is 11 mg per day. In children ages 1 to 3 years, the Recommended Dietary Allowance is 7 mg per day. Natural food sources of iron include certain fruits, vegetables, meat, and poultry. The Institute of Medicine also notes that nonheme iron, which is found in vegetarian diets, may be less well absorbed than heme iron, which is found in diets containing meat; therefore, the iron requirement may be almost twice as much in children who eat a purely vegetarian diet.

Fortified breads and grain products (such as cereal) are also good sources of iron for young children eating solid foods. Iron-fortified formula is another source of iron for infants. Federally regulated iron fortification of food products in the United States began in 1941, and the iron content in enriched grain products has increased over the years. More than 50% of the iron in the U.S. food supply comes from iron fortified cereal grain products.

Useful Resources

The USPSTF has published a separate recommendation statement on screening for iron deficiency anemia and iron supplementation in pregnant women (see the NGC summary of the USPSTF guideline Screening for iron deficiency anemia and iron supplementation in pregnant women to improve maternal health and birth outcomes: U.S. Preventive Services Task Force recommendation statement).

Definitions

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence

Level of Certainty	Description
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Iron deficiency anemia

Guideline Category

Prevention

Screening

Clinical Specialty

Family Practice

Pediatrics

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To summarize the U.S. Preventive Services Task Force (USPSTF) recommendation on screening for iron deficiency anemia in children ages 6 to 24 months

Target Population

Children ages 6 to 24 months living in the United States who are asymptomatic for iron deficiency anemia

Note: This guideline does not apply to children younger than age 6 months or older than 24 months, children who are severely malnourished, children who were born prematurely or with low birth weight, or children who have symptoms of iron deficiency anemia.

Interventions and Practices Considered

Routine screening for iron deficiency anemia

Major Outcomes Considered

- Key Question (KQ) 1: What are the benefits of screening for iron deficiency anemia in asymptomatic children ages 6 to 24 months on child health outcomes?
- KQ 2: What are the harms of screening for iron deficiency anemia in children ages 6 to 24 months?
- KQ 3: What are the benefits of treatment of iron deficiency anemia in children ages 6 to 24 months on child health outcomes?
- KQ 4: What are the harms of iron treatment in children ages 6 to 24 months?
- KQ 5: What is the association between change in iron status and improvement in child health outcomes in U.S.-relevant populations?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Pacific Northwest Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Methods

A research librarian searched the Cochrane Central Register of Controlled Trials, the Cochrane Database of Systematic Reviews (through the second quarter, 2014), and Medline (1996 to August 2014) for relevant studies to update the previous USPSTF reviews. Because the previous research focused on systematic reviews and key studies of treatments for iron deficiency anemia, they also searched the reference lists of systematic reviews to identify any additional, relevant studies published before 1996.

Studies were selected on the basis of inclusion and exclusion criteria developed for each Key Question (KQ). Articles were selected for full review if they were related to iron deficiency anemia in children who received an intervention (supplementation or screening and related treatment) between the ages of 6 and 24 months. The reviewers restricted inclusion to English-language articles and excluded studies published only as abstracts. For all KQs, the focus was on studies that involved iron supplementation and treatment regimens commonly used in clinical practice in the United States. They excluded studies conducted in resource-poor populations, including nutritionally deficient populations in developing countries and populations in areas expected to have a high prevalence of hemoparasites, by selecting studies conducted in countries listed as having

"high" or "very high" human development based on the international United Nations Human Development Index. At least 2 reviewers independently evaluated each study to determine eligibility.

Clinical outcomes of study were morbidity (including growth; cognitive, psychomotor, and neurodevelopmental outcomes; and diagnosis of developmental delay), mortality, and quality of life. Harm outcomes included accidental overdose, study discontinuations, and other harms related to screening, supplementation, or treatment. Included intermediate outcomes were incidence of iron deficiency anemia, iron deficiency, and anemia, as well as hematologic indices such as ferritin levels. Randomized controlled trials, nonrandomized controlled clinical trials, and controlled cohort studies were included for all KQs.

Number of Source Documents

No studies evaluating the benefits or harms of screening programs for asymptomatic children ages 6 to 24 months for iron deficiency anemia were found. See the flow diagram (Figure 1) in the systematic review for results of the literature search and selection process.

- Key Question (KQ) 1: No studies
- KQ 2: No studies
- KQ 3: No studies
- KQ 4: No studies
- KQ 5: No studies

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Two investigators independently applied criteria developed by the U.S. Preventive Services Task Force (USPSTF) to rate the quality of each study as good, fair, or poor. See the "Description of the Methods Used to Analyze the Evidence" field for further information.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review and full report were prepared by the Pacific Northwest Evidence-based Practice Center (EPC) for the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Methods

Details about the study design, patient population, setting, screening method, interventions, analysis, follow-up, and results were abstracted. A second investigator reviewed the data abstraction for accuracy. Two investigators independently applied criteria developed by the USPSTF to rate the internal validity (quality) of each study as good, fair, or poor. Discrepancies were resolved through a consensus process. When otherwise not reported and where possible, relative risks (RRs) and 95% confidence intervals (CIs) or *P* values were calculated.

The aggregate quality of the body of evidence for each Key Question (KQ) (i.e., good, fair, poor) was assessed by using methods developed by the USPSTF (see Appendix A5 in the full report); these assessments were based on the number, quality and size of studies; consistency of results between studies; and directness of evidence. Meta-analysis was not attempted due to the limited number of studies for each KQ and differences among studies in design, population, and outcomes.

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see Table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

**A, B, C, D*, and *I (Insufficient)* represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field).

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized controlled trial in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct randomized controlled trial evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence, the USPSTF constructs a "chain of evidence" within an analytic framework. For each Key Question (KQ), the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the KQ(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the KQ(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose–response effects, fit within a biologic model)?

The next step in the USPSTF process is to use the evidence from the KQs to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term *certainty* will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each KQ plays a primary role. It is important to note

that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each KQ—even evidence from screening randomized controlled trials or treatment randomized controlled trials—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in randomized controlled trials and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the KQs in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in randomized controlled trials may not be representative of those found in usual practice and because some harms are not completely measured and reported in randomized controlled trials.

Putting the body of evidence for all KQs together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several randomized controlled trials of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, KQs, and overall certainty of net benefit of the preventive service.

Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D; U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med. 2007;147(12):871-875. [5 references].

I Statements

For I statements, the USPSTF has a plan to commission its Evidence-based Practice Centers (EPCs) to collect information in 4 domains pertinent to clinical decisions about prevention and to report this information routinely. This plan is described in the paper: Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. Ann Intern Med. 2009;150:199-205. www.annals.org

The first domain is potential preventable burden of suffering from the condition. When evidence is insufficient, provision of an intervention designed to prevent a serious condition (such as dementia) might be viewed more favorably than provision of a service designed to prevent a condition that does not cause as much suffering (such as rash). The USPSTF recognized that "burden of suffering" is subjective and involves judgment. In clinical settings, it should be informed by patient values and concerns.

The second domain is potential harm of the intervention. When evidence is insufficient, an intervention with a large potential for harm (such as major surgery) might be viewed less favorably than an intervention with a small potential for harm (such as advice to watch less television). The USPSTF again acknowledges the subjective nature and the difficulty of assessing potential harms: for example, how bad is a "mild" stroke?

The third domain is cost—not just monetary cost, but opportunity cost, in particular the amount of time a provider spends to provide the service, the amount of time the patient spends to partake of it, and the benefits that might derive from alternative uses of the time or money for patients, clinicians, or systems. Consideration of clinician time is especially important for preventive services with only insufficient evidence because providing them could "crowd out" provision of preventive services with proven value, services for conditions that require immediate action, or services more desired by the patient. For example, a decision to routinely inspect the skin could take up the time available to discuss smoking cessation, or to address an acute problem or a minor injury that the patient considers important.

The fourth domain is current practice. This domain was chosen because it is important to clinicians for at least 2 reasons. Clinicians justifiably fear that not doing something that is done on a widespread basis in the community may lead to litigation. More important, addressing patient expectations is a crucial part of the clinician–patient relationship in terms of building trust and developing a collaborative therapeutic relationship. The consequences of not providing a service that is neither widely available nor widely used are less serious than not providing a service accepted by the medical profession and thus expected by patients. Furthermore, ingrained care practices are difficult to change, and efforts should preferentially be directed to changing those practices for which the evidence to support change is compelling.

Although the reviewers did not explicitly recognize it when these domains were chosen, the domains all involve consideration of the potential consequences—for patients, clinicians, and systems—of providing or not providing a service. Others writing about medical decision making in the face of uncertainty have suggested that the consequences of action or inaction should play a prominent role in decisions.

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

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C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.	Offer/provide this service for selected patients depending on individual circumstances.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality or conflicting, and the balance of benefits and harms cannot be determined.	Read the "Clinical Considerations" section of USPSTF Recommendation Statement (see the "Major Recommendations" field). If offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The USPSTF defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as: • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of: • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice

Level of Certainty	Description
	• A lack of information on important health outcomes More information may allow an estimation of effects on health outcomes.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review

Before the U.S. Preventive Services Task Force (USPSTF) makes its final determinations about recommendations on a given preventive service, the Evidence-based Practice Center (EPC) and the Agency for Healthcare Research and Quality (AHRQ) send the draft evidence review to 4 to 6 external experts and to Federal agencies and professional and disease-based health organizations with interests in the topic. The experts are asked to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. The draft evidence review is also posted on the USPSTF Web site for public comment. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the USPSTF in memo form. In this way, the USPSTF can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations, and Federal agencies, as well as posted on the USPSTF Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF Web site from March 31 to April 27, 2015. A few comments requested more information on which populations are at increased risk for iron deficiency anemia and to which population the recommendation applies. Existing language describing risk factors for iron deficiency anemia and the target population for this recommendation was inserted earlier in the statement to make this information clearer. Some comments also requested separate analyses of certain high-risk populations. Although the USPSTF sought this information, limitations in the evidence prevented it from performing separate analyses. A few comments noted that there was ambiguity in how the terms "iron deficiency" and "iron deficiency anemia" were used. The recommendation was reviewed to ensure consistent use of each term and language was added to better explain that the focus of the recommendation is on iron deficiency anemia.

Comparison with Guidelines from Other Groups

Recommendations for screening from the following groups were discussed: the Centers for Disease Control and Prevention (CDC), the Institute of Medicine, the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found inadequate evidence on the effect of routine screening for iron deficiency anemia in asymptomatic children ages 6 to 24 months on growth or child cognitive, psychomotor, or neurodevelopment outcomes. The USPSTF found no studies that evaluated the direct effect of routine screening programs on child health outcomes. The USPSTF found inadequate evidence (i.e., no recent studies that are generalizable to the current U.S. population) on the effects of treatment of iron deficiency anemia in children ages 6 to 24 months on growth or child cognitive or neurodevelopmental outcomes. No studies directly assessed the association between change in iron status as a result of intervention and improvement in child health outcomes. This represents a critical gap in the evidence.

Potential Harms

Harms of Early Detection and Treatment

The U.S. Preventive Services Task Force (USPSTF) found inadequate evidence on the harms of routine screening for iron deficiency anemia in asymptomatic children ages 6 to 24 months. The USPSTF identified no studies that evaluated the direct harms of routine screening on child health outcomes. The USPSTF found inadequate evidence on the harms of treatment of iron deficiency anemia in children ages 6 to 24 months. The USPSTF found no recent studies that are generalizable to the current U.S. population and reported on the harms of treatment of iron deficiency anemia with iron.

Qualifying Statements

Qualifying Statements

- The U.S. Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific clinical preventive services for patients without related signs or symptoms.
- It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.
- The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision making to the specific patient or situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.
- Recommendations made by the USPSTF are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality (AHRQ) or the U.S. Department of Health and Human Services.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other

print formats for dissemination, the USPSTF will make all its products available through its Web site . The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size Guide to Clinical Preventive Services.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Mobile Device Resources

Patient Resources

Pocket Guide/Reference Cards

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for iron deficiency anemia in young children: USPSTF recommendation statement. Pediatrics. 2015 Oct;136(4):746-52. [18 references] PubMed

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1996 (revised 2015 Oct)

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services or its agencies.

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The U.S. Preventive Services Task Force (USPSTF) is an independent, voluntary body. The U.S. Congress mandates that the Agency for Healthcare Research and Quality support the operations of the USPSTF.

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

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Former USPSTF members Virginia Moyer, MD, MPH, and Glen Flores, MD, also contributed to the development of this recommendation.

*Members of the USPSTF at the time this recommendation was finalized. For a list of current Task Force members, go to www.uspreventiveservicestaskforce.org/members.htm

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force (USPSTF) has an explicit policy concerning conflict of interest. All members disclose at each meeting if they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. USPSTF members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

Financial Disclosure

The authors have indicated they have no financial relationships relevant to this article to disclose.

Potential Conflict of Interest

The authors have indicated they have no potential coni¬,icts of interest to disclose.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: U.S. Preventive Services Task Force (USPSTF). Screening for iron deficiency anemia - including iron supplementation for children and pregnant women. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006. 12 p. [12 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available from the Pediatrics Journal Web site.

Availability of Companion Documents

The following are available:

Evidence Reviews:

- McDonagh M, Blazina I, Dana T, Cantor A, Bougatsos C. Screening and routine supplementation for iron deficiency anemia: a systematic review. Pediatrics. 2015 Apr;135(4):723-33. Available from the Pediatrics Journal Web site.
- McDonagh M, Blazina I, Dana T, Cantor A, Bougatsos C. Routine iron supplementation and screening for iron deficiency anemia in children ages 6 to 24 months: a systematic review to update the U.S. Preventive Services Task Force recommendation. Full report. Evidence Synthesis No. 122. AHRQ Publication No. 13-05187-EF-1. Rockville (MD): Agency for Healthcare Research and Quality; 2015 Mar. 66 p. Available from the U.S. Preventive Services Task Force (USPSTF) Web site.

Background Articles:

- Barton MB et al. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. Ann Intern Med 2007;147:123-27.
- Guirguis-Blake J et al. Current processes of the U.S. Preventive Services Task Force: refining evidence-based recommendation development. Ann Intern Med 2007;147:117-22.
- Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. Ann Intern Med 2007;147:871-75.
- Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. Ann Intern Med. 2009;150:199-205.
- U.S. Preventive Services Task Force procedure manual. AHRQ Publication No. 08-05118-EF. Rockville (MD): Agency for Healthcare Research and Quality; 2008 Jul. 95 p.

Available from the USPSTF Web site.

The following are also available:

- Iron deficiency anemia in young children: screening. Clinical summary. Rockville (MD): U.S. Preventive Services Task Force. 2015 Sep. 1 p. Available from the USPSTF Web site.
- The guide to clinical preventive services, 2014. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2014. 144 p. Available from the AHRQ Web site.

The Electronic Preventive Services Selector (ePSS) is an application designed to provide primary care clinicians and health care teams timely decision support regarding appropriate screening, counseling, and preventive services for their patients. It is based on the current, evidence-based recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following is available:

- Screening for iron deficiency anemia in young children. Understanding task force recommendations. Rockville (MD): U.S. Preventive Services Task Force; 2015 Sep. 3 p. Available from the U.S. Preventive Services Task Force (USPSTF) Web site .

Myhealthfinder is a tool that provides personalized recommendations for clinical preventive services specific to the user's age, gender, and pregnancy status. It features evidence-based recommendations from the USPSTF and is available at www.healthfinder.gov .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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